ROYAL GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 6.] JUNE. [1887.

XI.—BOTANICAL STATIONS IN THE WEST INDIES.

Considerable interest and activity is being shown in the West Indian Islands in order to reduce as much as possible the depression into which they have fallen consequent upon the low price of sugar. Many of the fertile lands in these islands have been well adapted to the remunerative cultivation of the sugar-cane ; but owing to the keen competition of beet sugar and to fiscal questions affecting its production, the price of cane sugar is now so low that this chief industry of the West Indies for the last hundred years is carried on under circumstances of extreme difficulty.

If improvements in cultivation were adopted, and if such high scientific skill as is applied to the manufacture of beet sugar were applied to the manufacture of cane sugar, it is the opinion of many that sugar-growing in the West Indies could still be remuneratively carried on.

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The object of this *Bulletin*, however, is not to reiterate the decadence of sugar, but to indicate the direction in which it would be wise and prudent to seek for means to alleviate the pressure of present circumstances. In islands differing so widely as regards soil, climate, conformation of surface, and elevation above the sea, in the number and character of population, and in local feeling and sympathy, it is difficult to generalise as regards the causes of failure in the past or of the remedial measures most likely to be successful in the future.

The spirit which now animates the people of the West Indies as regards the outlook of their industries is well expressed in a memorial forwarded to the Secretary of State by the people of St. Lucia, dated 20th April 1886. This memorial states :—

"That since the settlement of the island (of St. Lucia) the inhabi-
" tants have devoted their energies to the cultivation of the sugar-cane
" almost exclusively; the sugar industry having been found, with
" occasional fluctuations, fairly remunerative over an average of
" years.

"That causes have lately come into operation, the effect of which
" has been to reduce the price of the principal product of the Colony
" below the cost of production, and although the imminence of the
" danger which threatened them roused the people to make efforts by
" the importation of the most modern machinery, and the most
" approved scientific appliances for the economy of labour to secure
" the greatest outcome from sugar-cane; still but a small section of
" the people is in a position to take advantage of these means, the
" procuring of which necessitates an outlay of capital beyond the
" reach of the peasant proprietary class which forms the bulk of the
" producing portion of the population, and is the backbone of a country
" situated as ours is.

. . . . . .

"The people of St. Lucia are now eager to take up other economic
" plants, which are as yet unaffected by the causes which have brought
" about the depression in the cane industry, and the cultivation of
" which offers a reasonable prospect of profit.

. . . . . .

"It is our firm persuasion, therefore, that in the present critical position
" of the principal product of the island, and in the uncertainty which
" surrounds the future of the sugar industry, it is a matter of life and
" death to the Colony that other means of existence be at once brought
" within reach of the people, not only to avert an impending catas-
" trophe, but at the same time to lay the foundation of a more solid
" future prosperity."

There are at present in the West Indies (excluding British Guiana on the mainland of South America) six important Colonies. These are Jamaica, British Honduras, the Leeward Islands, with headquarters at Antigua, Barbados, the Windward Islands, with headquarters at Grenada, and Trinidad. These six Colonies have an aggregate area of 15,143 square miles, and a population in 1881 of 1,197,355.

In order to show the relative size and importance of these Colonies, the following table may be usefully consulted :—

Colony.	Area in Square Miles.	Population in 1881.	Revenue in 1885.	Chief Industries in order of importance.
			£	
Jamaica - -	4,193	580,804	595,156	Fruit, sugar, rum.
Turks Islands -	169	4,732	9,757	Salt.
British Honduras -	7,562	27,452	52,245	Mahogany, logwood, sugar, fruit.
Windward Islands—				
St. Lucia - -	237	38,551	38,493	Sugar, cacao.
St. Vincent -	147	40,548	23,857	Sugar, rum, arrow-root.
Grenada - -	133	42,403	41,894	Cacao, spices.
Tobago - -	114	18,051	10,825	Sugar, rum, cocoa-nuts.
Barbados - -	166	171,860	145,758	Sugar.
Leeward Islands—				
Virgin Islands -	57	5,287	1,753	Small produce.
St. Christopher -	68	29,137	41,243	Sugar.
Nevis - - -	50	11,864		
Antigua - -	170	35,244	41,957	Sugar, molasses, pine apples.
Montserrat - -	32	10,083	5,546	Sugar, lime-juice.
Dominica - -	291	28,211	15,841	Sugar, cacao, fruit.
Trinidad - - -	1,754	153,128	429,307	Sugar, cacao, cocoa-nuts.

The chief sugar islands at present are Barbados, Antigua, St. Vincent, Trinidad, and Tobago. Jamaica still produces sugar and rum to a large extent; but during the year 1886 the chief export of this island was fresh fruit, which was shipped to the United States of America to the value of 231,522*l.* The export of sugar was 202,791*l.*, and of rum 184,544*l.* At Trinidad cacao is largely grown, and the export value of this article is nearly two-thirds that of sugar. Coffee, spices, fibres, and fruit might very easily be added to the productions of Trinidad, and no doubt under the energetic administration of the present Governor, Sir William Robinson, K.C.M.G., steps will be taken in this direction. Grenada is in a comparatively prosperous condition, owing to the gradual supersession of sugar cultivation by that of cacao. Spices are also largely grown, and there are indications that this island, owing to the suitability of its soil and climate to the growth of nutmegs, cloves, cardamoms, pepper, and vanilla, will be known as the "spice island of the West." In 1885 Grenada exported 987 cwt. of spices, of the value of 5,526*l.* The area planted with nutmegs is yearly increasing. St. Vincent, possessing excellent natural resources, is in a lamentable state of decay, and produces chiefly sugar, rum, and arrowroot. Most of the land under cultivation is in the hands of a few persons, and hence land for small industries cannot readily be obtained.

Under favourable circumstances St. Lucia is well adapted to produce sugar, and if low prices had not ruled for so many years, no doubt an extension of plantations and the establishment of the *Usine* system would have raised this fertile and interesting island into an important sugar colony. At present, however, it has to fall back upon small industries such as cacao, coffee, spices, tobacco. The want of capital and ready means of communication between the interior fertile lands and the sea

seriously retards native enterprise, and prevents the growth of the prosperity which, however, it is felt, must come sooner or later to St. Lucia.

Dominica is third as regards size of the British West India Islands, but as regards utilised resources and general prosperity it is only a little better than Tobago. This is due to a variety of causes. The greater part of Dominica is still unopened virgin forest. The population is small and widely scattered. The old industries of sugar and coffee are in a state of decay, and no new ones have taken their places. Cacao, lime, Liberian coffee, fruit, and many other cultures are gradually being taken up, and the aggregate result of these, it is hoped, will in a few years bring prosperity to one of the most interesting of our possessions in the West Indies.

Antigua, like Barbados, is comparatively flat as compared with the other islands, and sugar plantations have been so largely extended over it that very little woodland is now left. Like Barbados, also, sugar is the chief industry in Antigua, and if ever new industries are established there, the process must be a very gradual one, and they will be only taken up when the remunerative growth of sugar has absolutely failed. Pine-apple culture is carried on to some extent, but both in the export of fresh fruit to England and the United States, and in canning it there is room for considerable expansion. Antigua would afford a good field for the experimental cultivation of fibre plants, and such plants as *Furcræa gigantea* and *F. Cubensis*, native to the West Indies, which support a fibre industry on the abandoned estates of Mauritius, should be largely planted. The sugar machinery might be adapted to the extraction of fibre, and the general level character of the surface would greatly contribute to reduce the cost of carting, and of all cultural operations. This subject, both as regards Sisal and Mauritius hemps, it may be added, has already been fully discussed in *Bulletin* No. 3, for March 1887.

Owing to the pioneering efforts of Messrs. Sturge, of Birmingham, Montserrat has become very favourably known for its lime-juice, the produce of the lime tree (*Citrus medica* var. *acida*), and in this respect they have benefited, not only this island, but many people in the other islands that have taken up the cultivation as imitators. Lime-juice is an article in limited demand; but it is hoped the Montserrat Company will extend its operations to other cultures for which the island is adapted, and so fully utilise the resources of this small but interesting island.

St. Christopher and Nevis are two islands lying closely together, united under one Government in 1883. The former is covered with green slopes of sugar-cane, sweeping all round the island towards the central cone, known as Mount Misery. It is fairly prosperous, owing to the number and character of its population. Nevis is also chiefly devoted to sugar growing, and it owes much of its importance to the enterprise of Sir T. Graham Briggs, Bart., who has spent enormous sums, not only in the endeavour to improve the character and efficiency of the sugar estates, but also to introduce other industries suited to the island.

The Virgin Islands, with a scanty population, are chiefly devoted to the cultivation of small produce by the peasantry, and to some rudely prepared sugar. Fibre plants are abundant, and might be utilised.

There only remain to be noticed two islands, viz., Barbados and Tobago. Barbados has hitherto been one of the most prosperous of the West India Islands, and with its teeming population, at the rate of

1,031 to the square mile, it is well adapted to carry on the careful and systematic cultivation of any plant suited to its soil and climate. Tobacco, fibres, arrowroot, aloes, are subjects receiving attention on a small scale, but nearly the whole of the land under cultivation is devoted to sugar-cane, and to growing sweet potatoes, the latter as an intermediary crop. What the future of Barbados will be, if it is compelled to relinquish sugar cultivation, it is difficult to see. The people are, however, so industrious and enterprising, and food is so comparatively cheap, that any industry well suited to the soil and climate has every prospect of success.

Tobago possesses what is known as the metayer system, in which the labour on sugar estates is supplied on condition of the peasants receiving the use of the land and of the mill for grinding, the owner receiving in return a certain fixed portion of the produce. Under such circumstances the cultivation is usually very poor and the system would appear not to be adapted to any other produce than sugar. As shown in the table on page 3, it is evident that within the area of 114 square miles at Tobago, free from hurricanes and destructive storms, there must be very favourable openings for the prosecution of small industries; and cocoa-nuts, fruits of various kinds, cacao, coffee, spices, arrowroot, ginger, and indeed most tropical products are capable of being added to the productions of an island which should be no less prosperous than the neighbouring islands of Grenada and Trinidad.

After thus briefly reviewing the individual characteristics of the Colonies included in the West Indian group, it is important to notice that with the exception of two islands, viz., Antigua and Barbados, it is estimated that one-half of the actual surface is better adapted for some other cultivation than that of the sugar-cane. This fact is an important one as bearing upon the possibility of embarking upon what are known as "minor industries," and it is evident that by too close an adhesion to the purely sugar-growing habits and methods, the people act injuriously to their best interests and neglect the numerous resources at their command.

In an article contributed to *Nature* by Mr. D. Morris, vol. xxxv. No. 898, pp. 248–250 (January 13, 1887) it is pointed out:—

"In purely sugar islands, such as Barbados and Antigua, permanent "improvement is to be sought in more economic and improved systems "of cultivation, added to which there should be a concentration of all "purely manufacturing processes under what is known as the *Usine* "system. This latter system is already in existence at Trinidad, "St. Lucia, British Guiana, and in the French island of Martinique; "and it is proved beyond question that where the manufacture of sugar "is treated as a highly specialised industry, finer and better qualities "are produced, and the expenses are considerably diminished. Planters are therefore recommended to confine themselves as much as "possible to the purely cultural operations of a sugar estate. Under "such a division of labour there would follow a more careful trial of "different varieties of the sugar-cane, adapted to the different soils, a "more scientific application of special manures, and such general regulation of all cultural operations as would produce canes of the highest "saccharine richness. In Barbados, Trinidad, and Jamaica, there are "already Government analytical chemists who are qualified to give "valuable information to planters as regards soils and manures; and "from a report recently prepared at Barbados by Professor Harrison it "is evident that much good would result from a larger ulilisation of "chemical knowledge as applied to sugar cultivation, both in the "interest of the individual and of the general community.

"During the last five or six years efforts have been made to increase "the efficiency of West Indian industries by a wider and more general "application of scientific methods not only to the sugar-cane but to all "other plants which may be found suitable to the circumstances of the "several islands. Hitherto two botanical establishments have been "maintained for the West Indies, one at Jamaica and the other at "Trinidad. From these centres, but especially from that of Jamaica, "economic plants and information by means of annual reports and "other publications have been regularly furnished, and such agencies "have greatly assisted in enlarging the scope of experimental culture."

In the Report of the Royal (West Indian Finance) Commission, appointed in 1883, Paragraph No. 247, it was stated that there was a growing inclination on the part of the planters in other West Indian Colonies to apply for seeds and plants to the botanical establishment in Jamaica, which could supply each island with what it required in the most economical manner. Sir Joseph Hooker, commenting on this report, at the request of the Secretary of State, in a letter dated 26th January 1885, expressed the opinion that there could be no doubt that the future prosperity of the West Indies would be largely affected by the extension to other islands, unprovided with any kind of botanical establishment, of the operations so successfully pursued in Jamaica.

A systematic endeavour to promote cultural industries in the West Indies by means of small botanical establishments in each island connected with Jamaica has now been under consideration for some time. Speaking of the special character and scope of the establishments or stations which were intended to be maintained, at a small expense, in each of the islands, Mr. Morris, Director of the Botanical Department, Jamaica, offered the following suggestions in a letter addressed to the Colonial Secretary of Jamaica, dated 28th October 1884 :—

"Being supported by the Government, it is very desirable that a "Government officer or a board appointed by Government should be "in general charge of the proposed botanical station, and that all "correspondence relating to it be carried on through such officer or "board.

"As the results of a botanical station are so entirely dependent on "its supervision and management, I would suggest that even if a "board be formed for the general improvement of planting industries, "the direct charge of the station should be left to some efficient Govern- "ment officer who would have knowledge of plant life, and be able to "devote a little time daily to its working and management.

"Possibly the Colonial engineer or the Crown surveyor would be "able to do this in some Colony, while a member of the Colonial "Secretariat would do it in others. Correspondence with and all "requisitions for plants from the Botanical Department in Jamaica "should invariably be carried on through the Colonial Secretary.

"For starting a botanical station a few acres of land in a sheltered "and protected (fenced) situation, and within reach of water is the "first requisite. A small potting and tool shed are all the buildings "actually required, while bambu for pots, and banana leaves and "'wattles' for shading purposes can be had close at hand in most "West Indian Colonies. The station as already mentioned should be "near the seat of Government, close to the chief shipping port of "the Colony, and well placed as regards communication with the "interior.

"The chief points requiring attention as regards the supervision of "the station are the regulation of working hours, the prompt treatment "of seeds and plants immediately they arrive, the assignment of plants

" ready for distribution, and the due supervision of the station so as to " keep it in an efficient working condition for supplying the special " needs of the Colony.

" A small charge, sufficient to cover the cost, might be made for all " plants raised at the station; while for plants imported direct from " Jamaica the cost would necessarily include packing and freight " charges, &c. A regular schedule should be supplied to each station " of the cost of plants which can be supplied from the establishments " in Jamaica, which will include packing and freight. This schedule " might be periodically published in the Official Gazette for the infor- " mation of planters. Lists of seeds to be forwarded by post can also " be similarly supplied and published.

" It has been suggested by Mr. W. T. Thiselton Dyer, C.M.G., the " Assistant Director (now Director) of the Royal Gardens at Kew, " who takes a deep interest in this attempt to develop the latent " resources of the West India Islands, that in addition to distributing " plants there might be organised at the Central Institution a regular " system of botanical bulletins containing practical hints as to the treat- " ment of economic plants, and the conditions under which they might " best be utilised as objects of remunerative industry.

" There is no doubt a great want felt in the West Indies for reliable " information on the culture of new economic plants; and to ensure " success it will be necessary not only to supply seeds and plants, but " also carefully compiled and plain practical hints as to the means to " be employed for rendering them of the greatest value.

" It will, however, depend entirely on the several islands concerned " whether the scheme of botanical stations, with the wide distribution " of botanical literature as herein indicated, can be fully carried out; " but judging from what I know of these well-placed and well-favoured " islands, and from some five years' correspondence with the leading " planters in them, I know nothing better calculated to benefit them " under present circumstances, or to prove more likely to be of " permanent benefit to them."

At the instance of Lord Derby, Secretary of State for the Colonies, it was decided that the whole of the smaller West India Islands not already provided with botanical gardens be asked to co-operate in a systematic endeavour to promote and extend the cultivation of economic plants, and thus develop more fully than heretofore their natural resources. In a Despatch, dated 14th February 1885, the Secretary of State addressed the Governors of Barbados, Leeward Islands, Bahamas, and British Honduras, as follows:—

COLONIAL OFFICE to the GOVERNORS OF BARBADOS, LEEWARD ISLANDS, BAHAMAS, AND BRITISH HONDURAS.

" Colonial Office, Downing Street,
" SIR, 14th February 1885.

" I HAVE the honour to transmit to you a copy of a report by " Mr. Morris, the Director of Public Gardens and Plantations in " Jamaica, on the establishment of botanic stations in the lesser " islands of the West Indies, together with a copy of a letter from the " Royal Gardens at Kew, conveying the observations of Sir J. Hooker " on the proposals.

" I strongly recommend the adoption of the proposed scheme in each " of the Presidencies of the Leeward Islands except the Virgin Islands, " which cannot afford even this small expenditure, in each of the " Windward Islands, and in the Bahamas and British Honduras.

"As the Jamaica establishment can, with a certain amount of " additional clerical assistance, undertake to communicate with and " supply all the proposed botanical stations, I do not think it necessary " that any of them should be connected with Trinidad.

" A contribution of 20*l.* a year from each Colony, Presidency, or " Island in which a botanical station is established would appear to be " sufficient to provide for the additional expense which the scheme " would entail upon Jamaica.

" I have, &c.
" (Signed) DERBY."

As a result of deliberation in the islands concerned, the Secretary of State, Colonel F. A. Stanley, now Lord Stanley of Preston, was able to communicate their acceptance of the scheme in the following despatch addressed to the Officer administering Government of Jamaica :—

" COLONIAL OFFICE to OFFICER ADMINISTERING THE GOVERNMENT OF JAMAICA.

" Colonial Office, Downing Street,
" SIR, 9th February 1886.

" I HAVE the honour to acknowledge the receipt of your de- " spatch No. 4 of the 6th ultimo, with reference to the proposal made " in 1884, that botanical stations should be established in some of " the West India islands in connexion with the Botanical Department " in Jamaica.

" On the receipt of Sir H. Norman's despatch No. 473 of the 8th of " November 1884, after consulting Sir J. Hooker, Lord Derby addressed " to the Governors of the Windward and Leeward Islands, of Bahamas " and British Honduras, an identical despatch, of which a copy is here- " with enclosed, transmitting copies of Mr. Morris's letter of the 20th " of October 1884, and recommending the adoption of the scheme in " those Colonies.

" The Colonies and Presidencies named as follows:—Barbados, " Grenada, St. Vincent, St. Lucia, Antigua, St. Christopher and Nevis, " Montserrat, Dominica, British Honduras, are prepared to establish " botanical stations and to provide 20*l.* a year each towards the " expenses of the Jamaica botanical establishment carrying out the " scheme.

" I trust that the Government of Jamaica will see its way to allowing " this scheme to be carried into effect; and in that case it will be " desirable that you should communicate direct with the Governors " of Barbados, the Windward Islands, the Leeward Islands, and British " Honduras.

" I have, &c.
" (Signed) F. A. STANLEY."

Consequent upon a change in the directorship of the Department at Jamaica, and the prolonged quarantine regulations maintained against Kingston at Barbados, it was impossible to place the scheme in operation at once. At Grenada, however, a small botanic garden is in course of being established under the charge of Mr. W. R. Elliott, formerly of the Botanical Department, Jamaica, who has issued a first report on the work already done; while under sanction of an Act of the Legislature, a sum of 100*l.* was granted to establish a botanical station at

Dodd's Reformatory, Barbados. In a letter, dated 6th July 1886, addressed to the Colonial Office, the Assistant Director, Royal Gardens, Kew, referred as follows to the Barbados station :—

"When at Barbados in March last I visited Dodd's Reformatory, at "the invitation of the committee appointed by the Government of "Barbados to supervise its management, and gave assistance in "selecting a piece of land for the purpose of being laid out as a "nursery for economic plants in connexion with the proposed botanical "station.

"At the same time I was shown the area of nearly 90 acres in "extent, upon which the sugar-cane experiments were being con- "ducted, and was impressed not only with the suitability of the "locality for the purposes in view, but also with the zeal and capability "of Professor Harrison, Chemist to the Agricultural Society of Bar- "bados, and Mr. Bovell, the Superintendent of the Reformatory, who "evidently had entered upon the experiments with aptitude and "knowledge of a special character.

"Although this is the first year of the experiments, the report "presented to the Government of Barbados is given in the current "number of the 'Sugar Cane,' and also with more complete tables "in the 'Barbados Agricultural Gazette' for June 1886. It is a "valuable contribution to sugar-cane literature, and deserves special "notice.

"It will be observed, on a perusal of this report, that the chief "points sought in the experiments were, first, the influence of some "21 different kinds of manures on the growth by weight of canes "isolated in different plots; and, secondly, the influence of these "different manures in producing a certain number of pounds per acre "of crystalline sugar.

"It would appear from these experiments that sulphate of ammonia, "by many believed to be an excellent manure for sugar-cane, is "practically worthless when used alone, but very valuable when used "with the addition of either superphosphates or potash salts. Farm- "yard manure, when obtainable, is evidently the best of all manures "for sugar-cane, and gives relatively a larger yield of crystalline sugar "than any other.

"There are many other points upon which it is possible to dwell in "this report, but as Professor Harrison and Mr. Bovell hope to carry "on these experiments from year to year, there are good grounds for "hoping that an advance will be made in the treatment and cultivation "of the sugar-cane, and it is for those who believe that the future of "the sugar-cane depends upon the scientific improvement of its agri- "culture to carefully watch such experiments, and turn them to the "best advantage as their several circumstances will allow."

At St. Lucia consequent upon the approval of the Secretary of State of a vote of 300*l.* in its support, a botanical station is being established near Castries under Mr. John Gray, lately of Jamaica, "an experienced "horticulturist, and a man calculated to be of great service in diffusing "horticultural knowledge amongst the people of St. Lucia." This station is supervised by a committee appointed by the Government.

At Dominica, Antigua, Montserrat, Nevis, and St. Kitts, so far, stations have not been started, but it would appear that interest in the scheme has by no means failed. If Dominica had been in a more prosperous condition, it might have been possible, as suggested by Dr. H. A. Alford Nicholls, to establish a central botanical establishment there for the whole of the Leeward Islands. Already, owing to the keen interest taken by the late Dr. Imray, and latterly by Dr. Nicholls

himself, a large number of very valuable plants have been established at St. Aroment, which might provide the means for supplying a botanical garden with seeds and plants at a small cost. Many of these plants have been sent out from Kew in exchange for Dominica plants established and forwarded by the unaided efforts of the two gentlemen above-mentioned. The site of a garden might be obtained within easy reach of the town of Roseau; and there are few men in the Leeward Islands possessing better knowledge and a keener interest in economic plants than Dr. Nicholls, who is evidently willing to assist as far as possible in establishing a botanic garden in an island likely to benefit so largely by it as Dominica.

Perhaps no island requires more assistance in the prosecution of small industries than St. Vincent. This island formerly possessed a botanical garden, which, however, was removed to Trinidad about 60 years ago. The following particulars respecting the old botanic garden at St. Vincent are of special interest in view of the effort now being made to revive it.

"This garden was established in 1764. It is situated in a small "valley, about a mile from Kingstown, where 40 acres of land are "still the property of the Crown, and where the Lieutenant-Governor's "residence is situated. Of these 40 acres, about one-third was devoted "to the garden, the rest being waste.

"Superintendents, at liberal salaries, were from time to time sent out "from England, and much care and labour were expended by the "Imperial Government upon it. The superintendent employed 12 "negroes.

"That its success attracted due notice in England is gathered from "the fact that Dr. G. Young, the first superintendent whose name is "recorded, received in 1772, from the Society of Arts, a gold medal, "in recognition of the flourishing state of the garden.

"Valuable contributions were made from distant countries, from the "East Indies, from South America, and from the Pacific Islands. In "1793 Captain Bligh introduced the breadfruit from Tahiti, leaving "here 300 plants. This valuable fruit is now common in St. Vincent. "Nutmeg, cinnamon, cloves, and allspice were also planted in the "island. A number of fine nutmeg trees still attests the care originally "bestowed upon them."

At the request of the Secretary of State, the following memorandum was recently prepared (18th February 1887) by the Assistant Director, Kew, relative to the steps to be taken to give practical effect to the scheme of botanical stations in the West Indies:—

"To set the scheme in operation it is necessary in the first place that "the Government of Jamaica (in accordance with the terms of the "Secretary of State's Despatch, 9th February 1886) communicate its "acceptance of the scheme, and the date when the Jamaica Botanical "Department will be ready to act, to the Governors of Barbados, the "Windward Islands, the Leeward Islands, and British Honduras.

"Seeds may very conveniently be distributed by pattern and parcel "posts; but the transit of plants is a subject which requires special "consideration, and arrangements will have to be made for carrying "them at cheap rates and in a careful and successful manner.

"In my recommendations on botanical stations (*see* paragraphs 22 "and 23, letter No. 558, 28th October 1884) I mentioned that freight "rates on cases of plants carried inter-colonially by the Royal Mail "Company's steamers were practically prohibitory.

"Although twice reduced at my urgent request they are still so "high as to amount to more than the original cost of the plants. A

" representation might be made by the islands concerned to the " directors of the Royal Mail Company to carry all economic plants " calculated to lay the foundation of new industries free of charge. " A concession of this character has been made and carried out by " the P. and O. and other eastern steamship companies for many years.

"A similar concession made in the West Indies would give a great " impulse to the distribution of plants and reduce the cost at which " they might be distributed to the several botanical stations.

"Action on this point would more appropriately come from the " Agricultural Societies of the several islands and not from Govern- " ment. But it is a subject which very intimately concerns the success " of the botanical station scheme, and should, if possible, be settled " before the scheme is placed on its trial.

"An occasional bulletin, containing hints as regards new industries, " list of plants for distribution, and any general information affecting " the relations of the central establishment to the stations is an im- " portant feature in the scheme. Arrangements might be made to " issue such bulletins, or at least a preliminary one, as soon as the " director of the Botanical Department at Jamaica is prepared to set " the scheme in operation.

"The cost of printing the Bulletin would be defrayed out of the " contributions of the several islands, and they might be forwarded " by mail to the address of the Colonial Secretary or officer in charge " of the station.

"A complete schedule, to be varied from time to time as occasion " required, should be prepared of seeds and plants available for distri- " bution at the Central Establishment, and the cost at which they could " be delivered in the several islands. This schedule might appear as " a permanent feature in the Bulletin.

" It is important that applications for seeds and plants in connexion " with any island be received at Jamaica from some recognised person, " such as the Colonial Secretary or officer in charge of the station. " The Central Establishment would thus correspond with only one " person in each island, and that person would forward requisitions " and make payments for everything received from the Central " Establishment.

"The control of each station would be entirely in the hands of the " local government. The connexion with the Central Establishment " would be confined to dealing with applications for information on " local industries, for seeds, plants, or other purposes of a purely " consultative character.

"When communicating the adoption of the scheme to the other " islands, the Government of Jamaica will no doubt exactly define the " lines on which it is to be worked. The contribution of 20*l.* per " annum agreed to be paid by each of the local Governments to " Jamaica might be defined as intended to provide extra clerical " assistance at the head office and to cover cost of printing the " occasional bulletin, and other matters specially relating to the " stations.

"For seeds and plants required either by the stations or by private " individuals applying through the stations, payment should be made " in accordance with a general system, particulars of which would be " entered on the schedule above mentioned; and the amounts due " should be remitted to Jamaica at the time of order. Where this is " not possible it should be understood that expenses incurred at " Jamaica in behalf and at the request of any officer representing a " botanical station are chargeable to that station, irrespective of the

" fact whether they are ultimately intended for a private individual or " for the station.

" It might be useful to state clearly at the outset that the Central " Establishment has fully discharged its duty and obligations by placing " plants in good order on board the steamers at Kingston. No question " of liability should arise as regards plants damaged or lost in transit. " The stations must necessarily bear all risks of this character. They " should therefore interest themselves to secure careful treatment for " the plants by officers of the Royal Mail Company, and make the best " arrangements they can with the directors as regards transhipments, " freight charges, &c."

From the details given above, it will be observed that the scheme of botanical stations for the West Indies is one which seeks to meet the special circumstances under which they are now placed, and to do so in the most flexible and economical manner, and it is evident that by the adoption of such a scheme, which practically amounts to a botanical federation for purely economic purposes, these islands will be enabled to act much more thoroughly and economically as a whole than if each one depended entirely upon its own resources. The recent appointment of Mr. William Fawcett, B. Sc., F.L.S., a highly qualified botanist, to the post of director of the Botanical Department at Jamaica appears to offer every hope of success to the scheme. It is also anticipated that while granting valuable aid to the smaller islands, Jamaica as a centre will herself derive, both directly and indirectly, considerable benefit from such vigorous and systematic working as would naturally arise in her own area as well as from a larger interchange of plants and seeds with the neighbouring islands.

Considerable interest is being taken at Kew in this attempt to group scattered colonies, aud place them in a position to help each other in the development of local industries. The discussion of this scheme has already suggested the possibility of forming botanical stations in the several West African Settlements which are making an effort to turn to good account their natural productions. These have not hitherto been so largely utilised as they might be. The efforts made for so many years to assist Colonial industries by Kew has naturally thrown upon this establishment a large share in solving the botanico-economic questions which have affected the Colonies during the last 50 years. As a natural process of growth, it is only reasonable to expect that well-marked groups of Colonies should combine as regards questions of scientific and industrial interest, and that Kew should deal directly only with the recognised centre, from which would be distributed such special information and such collections of seeds and plants as are specially suited to local circumstances, and which could from time to time be reinforced from Kew. How far schemes of this kind can be carried out remains to be seen. At present there are good grounds for believing that the scheme will soon be on its trial in the West Indies, and the experience gained there will greatly assist in laying down the details of a further scheme that may prove of great value to the West African Settlements.

D. M.

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